

## Theory of the pseudogap in the elementary excitation spectrum of the normal phase of bilayer cuprates

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### Abstract

Solutions of the integral equations for the pseudogap in the elementary excitation spectrum of current carriers in bilayer cuprates are found. In the general case, the pseudogap possesses  $s+id$  symmetry, where the  $s$  component is determined by the interaction of holes via the phonon field and the  $d$  component is due to the superexchange interaction of the copper spins and the Coulomb-repulsion screened holes. The  $s$  and  $d$  components exhibit different temperature dependences. This fact enabled us to explain the characteristic features of the temperature behavior of the normal-phase spin susceptibility of lightly doped cuprates, specifically, for the compound  $\text{YBa}_2\text{Cu}_4\text{O}_8$  in the entire temperature interval  $T > T_c$ . The wave-number dependence of the pseudogap agrees with the photoemission data for  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+y}$ . © 1997 American Institute of Physics.

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